Manual

River Line

TV43 & TV58

Basic Line

TV44 & TV59

Premium Line

TV61 & TV90

English V2.08 / 2010

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1. The digital satellite tracking system

The advanced technologies of the satellite tracking system EPAK-TV makes an excellent television reception possible. An 360° high-speed tracking guarantees a non-stop reception of your favourite channels even during your trip in open seas. Once the connection to a satellite is established, the tracking system will stay connected to that satellite even in the roughest sea conditions.
The EPAK-TV system is suitable for vessels of any size including smaller boats of less than 36ft (11m). According to different tracking conditions of the respective region a choice between a reflector antenna dish of 18" (45cm), 23.6" (60cm) and 35” (90cm) in diameter is neccessary. The antenna is capable of tracking horizontally, vertically and in case of the Premium Line antennas also in polarization angle (skew) due to its direct servo drive. We developed the patent-registered high-speed tracking sensors that provide together with other high-tech components a topmost and dynamic tracking accuracy of a satellite. The TV-system is protected by a UV-stabilized and maritime climate proof radome.

To provide an unlimited reception of available channels – just like at home, we attach great importance to high tracking stability and quality as well as easy handling and maintenance.

Note! The reception of channels in different regions depends on the footprints of the satellites. Also, the TV reception can be affected by rain, snow, dense clouds and extreme movement thus there is no warranty for the reception of certain channels.

Note!! Don't use alcohol, dilution or similar products for cleaning the radome!

1.1. EPAK®-TV system overview

Models	Single	Twin	Quattro	Bands EU
TV 43 / TV 44	X	X	-	4
TV 58 / TV 59	X	X	X	4
TV 61 / TV 90	-	-	X	4

If you wish to use the respective antenna with one or more receivers, please check chapter 7.6.2 of the manual.

1.2. Safety recommendations

1. Please consider the maximum allowable power voltage for the antenna unit. The DC voltage must be between 12 and 36 volts and the overload protection should be rated at min. 5 amp. and max. 7.5 amp..
2. The mounting distance from the antenna unit to other radiation sources, e.g. radar equipment or other transmitting antennas, should be at min. 2.5 m (8 ft).
3. If the satellite antenna is not installed above the radar antenna, simultaneous operation of both systems may damage the satellite antenna.
4. Do not use the control unit outdoors!
5. During a thunderstorm, we recommend to disconnect all connection cables.
6. If the negative side of the antenna unit's supply voltage has no connection to the ship's ground (earth), then the antenna unit's ground point should be connected directly to the ship's ground (earth).
7. After the installation is completed all other electronic systems, i.e. GPS, Radar, VHF, FM, AM etc., should be tested for full functionality while the antenna is turned on.
8. Do not test or turn on the antenna before the radome is fitted correctly. The electronics can be damaged by the reflected sun.
9. Do not touch the rotary joint.
10. Do not open the sealed electronic box, as this will void the warranty.

2. Installation

2.1. Standard delivery

The satellite tracking system EPAK-TV comes complete with the antenna and the following system components:

- Antenna unit (with serial number)
- Control unit
- Four mounting screws M 8
- Manual

Please check the completeness of all components. Make sure that no transport damages exist before you start the installation.

2.2. Installation overview

The installation work has to be done in the following order:

- Select location
- Check the mounting surface for stability
- Check cable path
- Position of power distributor
- Drill holes and lay the cable
- Install antenna unit (**see also addendum for instructions of how to undo the fixed transportation position before power-up**)
- Make all installation openings watertight
- Connect cables

For the installation at least the following tools are needed:

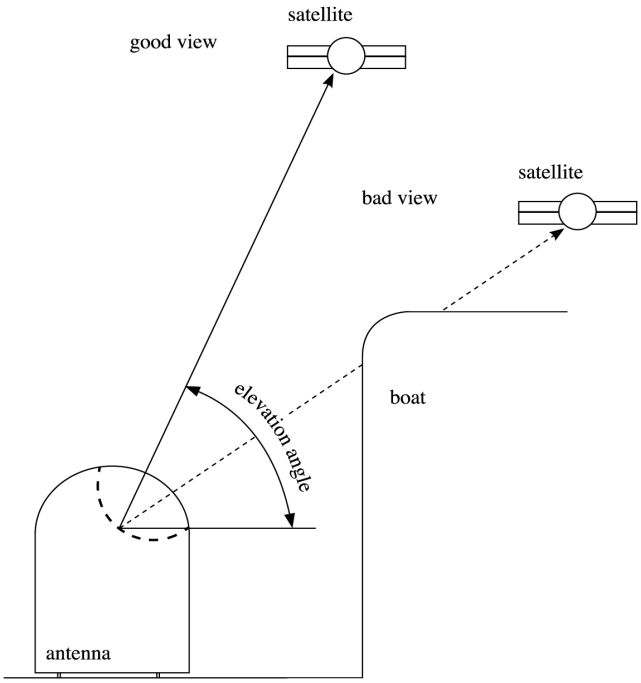
- Electric drill
- One 4mm and one 8.5-9 mm drill bits
- Hexagon socket screw key size 6 and 4
- 13mm screw wrench

Plan the entire installation first! To avoid mistakes or damages to the boat or satellite tracking system, please read the installation instructions carefully before starting the installation.

2.3. Selecting location

The best location for the TV-antenna is a raised position on your ship. Thus, the needed unobstructed view from the antenna to the satellite with the respective elevation angle can be established. In order not to affect the picture quality or not to damage the antenna, please observe the minimum distance of 8-12ft. (2-3 meters) to the radar equipment and other transmitting antennas! That includes mobile communication units! If there is a radar antenna, the ideal location to mount the antenna will be right above the radar antenna. Please also note that a strong mounting surface is needed and please avoid direct waves and bilge water on the radome. For further details see chapters 2.4 – 2.9.

The following illustration shows the importance of a proper location for the antenna unit.



2.4. Mounting surface

A horizontal, solid and steady, and even surface has to be ensured. The weight of the antenna unit can be 26.5lbs (12kg) up to 123.6lbs (56kg) (depending on the model) and must not be confronted with punctual material stressing. The surface has to be strong enough to carry the antenna unit, even during the most challenging maritime conditions.

2.5. Planning the cable paths

Before starting the installation, please check which walls are suitable and if existing openings can be used for the cables.

All openings have to be sealed!

The control unit should be placed as close as possible to the receiver. The cable length should not extend 3 m and the cable must be type 1 (see chapter 7.6.1 for data concerning appropriate cable types).

2.6. Power supply

The antenna unit can be connected directly without a converter to any ship's power supply net of 12/24/32 volts DC. The circuit fuse should be rated for min. 5 amperes and max. 7.5 amperes! (see chapter 7.8 “Technical Specifications”).

The power distributor must be idle while working on the ship's supply net or you short circuit the system.

If the negative side of the supply voltage of the antenna unit has no connection to the boat ground, make sure a potential compensation between boat ground and the ground point of the antenna unit is made.

2.7. Drillings

For an ideal mounting of the antenna we prepared all possible drilling pictures with a diameter of 2 mm in the bottom of the radome.

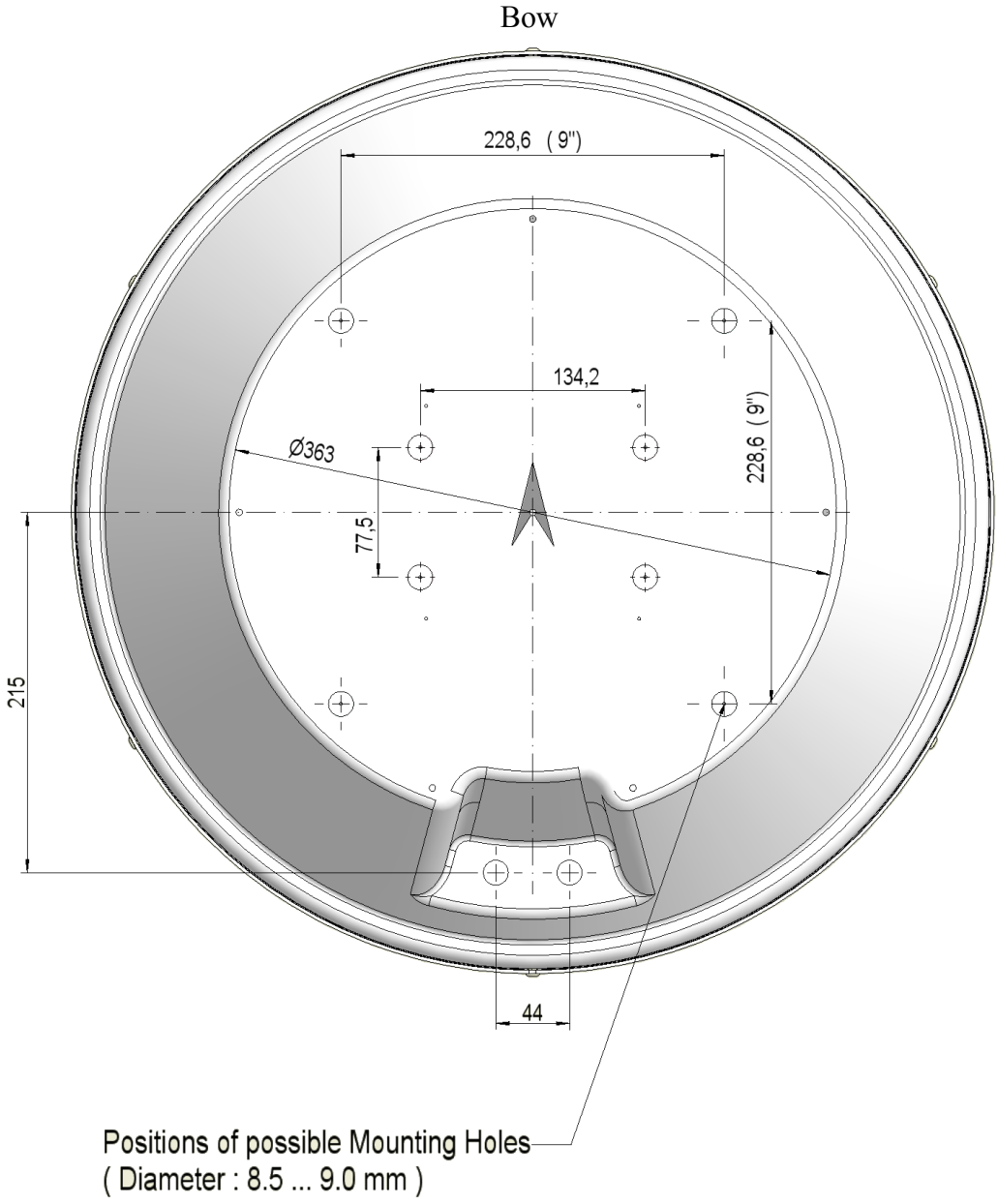
Please refer to the included template for the drilling measurements (see bottom from below!). The drilling holes have to have a size of ∅ 8.5 – 9 mm for the included M8 screws. We recommend to start with drilling a smaller hole, using a ∅ 3.5 – 4 mm bit to avoid any damage to the mounting surface. To mount the antenna, only use the included M8 mounting screws!

!! If the antenna unit is not mounted on a device carrier or separate mounting plate, close all drilled holes with waterproof sealing material to avoid any water penetrating!

Possible dimensions:

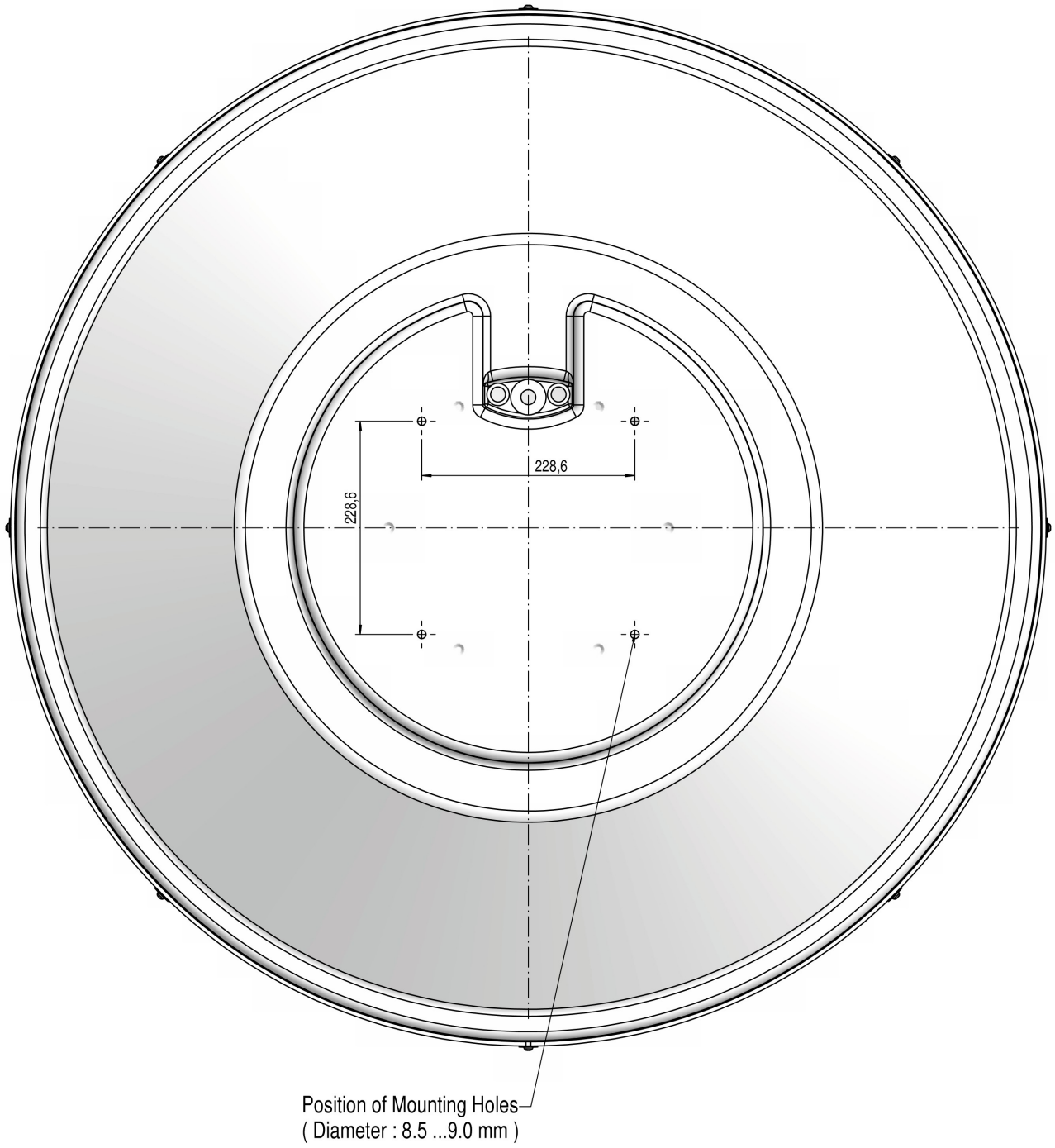
River Line & Basic Line: 228.6 mm x 228.6 mm and 134.2 mm x 77.5 mm

For a good and steady mounting of the antenna we recommend the drilling picture 228.6 mm x 228.6 mm. For the drilling picture 134.2 mm x 77.5 mm you will find tapped holes at the bottom plate of the antenna, so no nuts would be necessary.



Premium Line: 228.6 mm x 228.6 mm

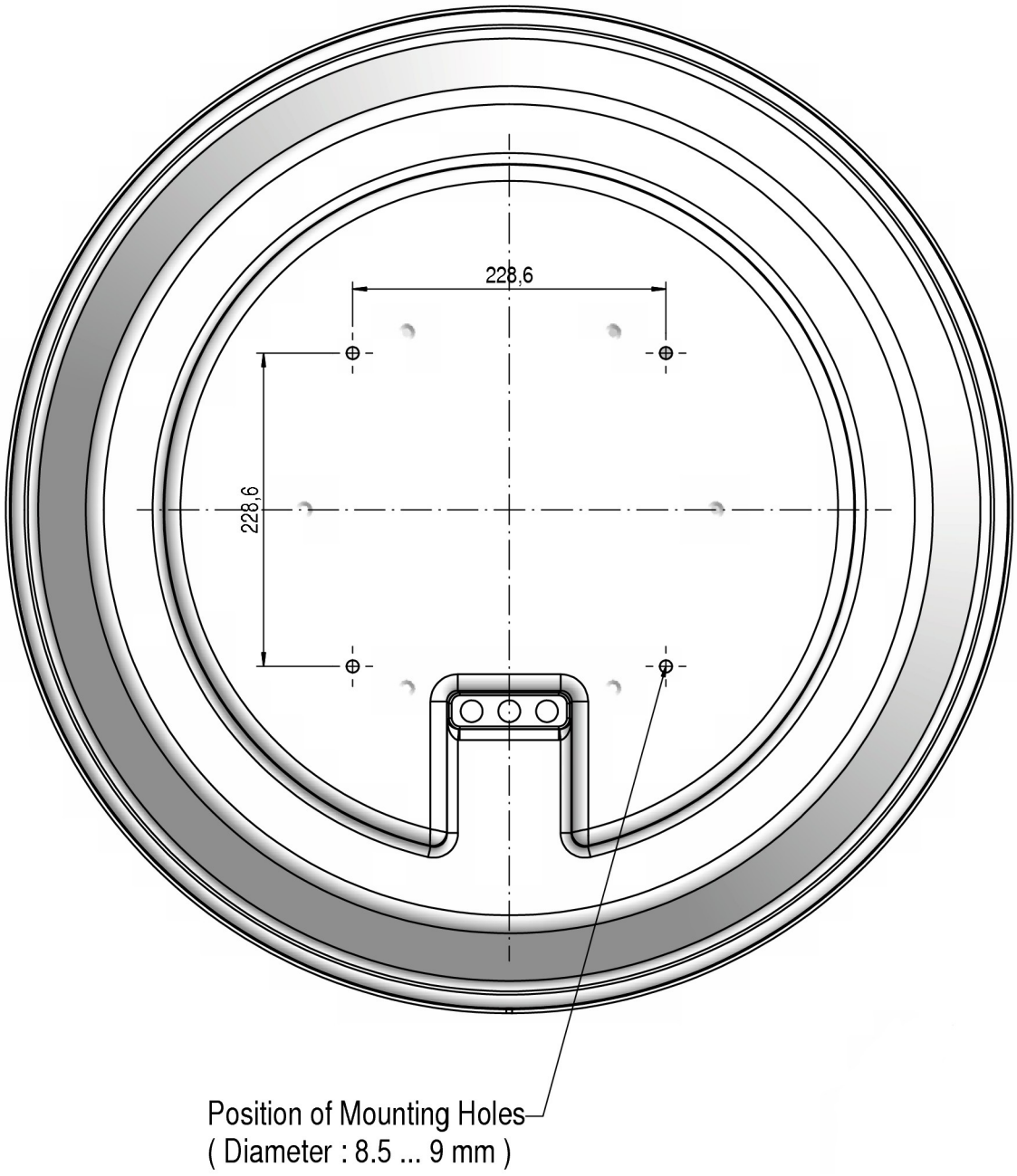
TV90



Bow

Premium Line: 228.6 mm x 228.6 mm

TV61



2.8. Mounting the antenna unit

The antenna unit has to be mounted on a solid and steady surface. Take care that the cable lengths are sufficient - the antenna unit must have an unobstructed view to the satellite and that there are no interfering fields (especially mobile communication antennas) nearby. Place the antenna unit on the pre-drilled holes and fasten it with the included screws and washers. The screws have to be screwed in from below through the mounting surface into the radome.

!! Close all drilled holes with waterproof sealing material to avoid any water penetrating!

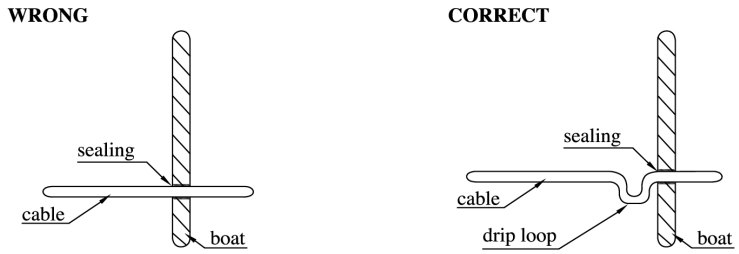
2.9. System cable connections

!! Break the contact of the circuit on which you are working to avoid a short circuit of the system.

- The antenna cable must be connected to the control unit and the antenna unit, (cable type 1).
- The power supply cable to the power distributor and the antenna unit.
- The receiver cable to the control unit and the receiver, (cable type 1).

!! See system overview and illustration details, chapter 7.6.1 and at the end of the manual.

Lead the cable through the drilled holes and seal it with waterproof sealing material. Furthermore, drip loops should precede the entry point from the exterior to avoid any water penetrating. See illustration below:



Find a suitable location for all units within cable lengths, meaning the control unit should be placed nearby the receiver. Take care that the display of the control unit can be easily read and the buttons are accessible. Also, allow room for the cables behind the control unit!
The antenna unit is separated from the power supply net by the control unit. Therefore, the antenna unit only has electric power when the control unit is turned on!

3. Control elements

3.1. Control unit

The EPAK-TV system is controlled by the control unit. See below a short overview of the key functions:

- ⏻ **Power key**: Shortly pressed will turn on power or will enter Standby mode.
- ↻ **Browse key:** Shortly pressed will browse through all available menus and setups or will cancel a current process.
- ✔ **Select key:** Shortly pressed will select/confirm what is written in the display.

Note! From the Standby mode: Press and hold the Select key while using the Browse key to scroll through available data: serial no., counter operation time, and software versions (see chapter 6.3.).

3.2. Preparing the receiver

EPAK-TV does not need a special receiver. The satellite tracking system can be connected to any commercial receiver for digital and analogue reception. Only the LNB-type in the setup menu of the receiver has to be set on “Universal” (LOF 9,75/10,6 Ghz). If you want several satellite positions, the DiSEqC ™ function for an automatic satellite switch has to be activated (not valid for Quattro antennas)

To program your receiver, please refer to the respective owner's manual!

!! For every satellite at least one program must be preprogrammed in the receiver to control the satellite position of the antenna unit by means of the TV picture quality. If not, pre-program the receiver by using an already installed satellite system!

!! In case the receiver supports the function, adjust the receiver so that the power supply of the LNB is turned off during the Standby-mode. This means that the control unit and the antenna unit are without power supply. This function enables the turning on and off of the antenna unit via remote control of the receiver, which lowers the power consumption.

!! In case several receivers are connected to the antenna simultaneously (e.g. a digital receiver with looped through analogue receiver) both receivers must have identical DiSEqC ™ settings, i.e. both active or inactive.

3.3. Power on / off / Standby

The antenna unit is controlled by the control unit. By pressing the ⏻ (Power) key, the initialization starts. The initialization will finish by showing Setup on the display (if no stallites are stored). If the antenna was aligned to a stored satellite before the antenna was turned off, it will try to regain that satellite. Press the ⏻ (Power) key again, to return to the Standby mode.

!! If the control unit is in Standby mode there will be no power supply to the antenna.

3.4. Password access to Setup menu

To gain access to the Setup menu please enter a password first to avoid a change by accident in the Setup menu. It is always the same password which has to be entered. When Setup is flashing in the display:

1. Press ✔ The display will show: ----
2. Press ↕ The display will show: X---
3. Press ✔ The display will show: XX--
4. Press ↕ The display will show: XXX-
5. Press ✔ The display will show: XXXX

The time between each keystroke should not exceed two seconds or the password request will be annulled. If so, the display will return to a flashing Setup and you will have to restart from point 1. If the password is entered correctly, you are now in the Setup menu.

3.5. Adjusting the Setup parameters

Modifications can only be made within the Setup menu. In the main menu only the flashing functions can be selected.

1. Turn on the control unit. The display shows Init (flashing), meaning initialization is in progress.
2. After the initialization is completed, you are in the main menu with the display flashing Setup. If the antenna was aligned to a stored satellite before the antenna was turned off, it will try to regain that satellite. To cancel this process press repeatedly the ↕ key until you get Setup flashing on the display. The Setup menu has password access – see how to enter the password in chapter 3.4.
3. If the password is entered correctly, you are now in the Setup menu. The display shows Tracking, press ✔ to select or press ↕ to continue at point 5 .
4. Tracking is preset to On. Switch between On and Off with the ↕ key. With Off, tracking is deactivated (see chapter 4.1). With On, tracking is activated i.e. the satellite can be tracked (Standard). Press ✔ to select.
5. The display shows Tracking. Press ↕ to go to the FastScan mode. Press ✔ to select or ↕ to continue at point 7.
6. FastScan is preset to On . Switch between On and Off with the ↕ key (see point 6.4). With On, Fastscan is activated i.e. the search for the correct satellite works faster (US only). Press ✔ to select. (We do not recommend a change in Europe.)
7. The display shows FastScan. Press ↕ to go to LNB Type. Press ✔ to select or press ↕ to continue at point 9.
8. The display will show the standard setting lin 0 which is valid for Europe. By pressing the ↕ key you can change the LNB settings. Press ✔ to select. The display will return to LNB Type. (Its just relevant in band tracking mode for premium line antennas)

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!! Please consider that the type is preset to lin 0. The LNB mounting plate allows a modification of the skew, which can be adjusted to the location.

   Important: In addition to the changes of the control unit the skew (polarisation angle) at the LNB and the matrix has to be changed accordingly (attend to the addendum „ How to adjust the polarisation angle(Skew)“).

!! Reception from circular polarized satellites will require a circular LNB type.

To change this, go to the SETUP menu till the display shows LNB Type

Press ✔ to select, then press ↕ until the display shows Circular and press ✔ to select.

9. Press repeatedly ↕ to go to quit and press ✔ to leave the Setup menu.

4. TV operation

Press the ⏻ key to turn on the control unit. The display shows `Init.` for initialization. After the initialization is completed, the display interchanges between `scanning` and `Sat. X` (X represents the last shown storage position), if the antenna was aligned to a stored satellite before the antenna was turned off, until the satellite has been located. The system will now run a check on the satellite: `checking` appears on the display. If it is ok, the display will briefly show `complete` and then return to `Sat. X`. The antenna will maintain its connection to the satellite even when the boat is moving. (Providing that the `Tracking` function is active (`On` in the Setup menu), see chapter 3.5).

If you wish to select a different satellite, press ↻ repeatedly until the desired satellite position appears and confirm with ✔.

!! If no satellites are stored, the display will show `Setup` (flashing). Now you are back in the main menu and can add new satellites (see chapter 5.1).

If the recovery for the satellite takes more than 1 minute, even though there is a free line of sight to the satellite, or if, after several times of finding the right satellite, the display shows `upd reco` interchanging with the actual satellite number, the satellite data base has to be updated, see chapter 5.2.

!! The menu item `Upd Sat.` is not shown when the `Tracking` function is deactivated (see chapter 4.1).

If, after the search of the satellite, the display shortly shows `complete` and afterwards `Sat. X` without a picture on the TV, there are two possibilities:

1. The satellite service provider has changed the transponders or it is the wrong satellite. In order to proof the right satellite has been found, try to switch to other programs on the receiver. If all other programs are in their usual places, you need to reprogram your receiver for the program which has changed. Please refer to the manual of the receiver.
2. US only: In case no program can be received, try to turn `Off` the `Fastscan` function (see chapter 6.4).

When changes are made, return to `Sat. X` and press ✔ for the recovery. If the recovery of the satellite takes longer than 4 minutes and after some time the display shows `scanning` interchanging with `Sat. X` (and there is a free line of sight), then the requested satellite could not be found.

In this case it is recommended to delete this satellite position like shown in chapter 5.3 and search it and restore it again like shown in chapter 5.1.

If the antenna loses the signal from the satellite (due to a passing boat, buildings on shore, bridges, or superstructures on own boat), the display will show `blocked` for the duration of the missing satellite reception.

Depending on the situation the recovery will start automatically. The display interchanges between `scanning` and `Sat. X`. In case superstructures obstruct the view to the satellite, turn the vessel or the satellite cannot be found!

!! To select a stored satellite, refer to chapter 5.4.

4.1. Stopping the Tracking function in harbours

If the boat is in a harbour, the tracking function can be deactivated to stop the tracking (noise-reduction). Proceed as follows:

1. Press ↻ repeatedly until the display flashes. You are in the main menu.
2. To go to the Setup menu, press ↻ repeatedly until the display shows Setup (flashing), then press ✔. Enter password, see chapter 3.4. If the password is correct you are in the Setup menu with Tracking on the display.
3. Press ✔ to select, and press ↻ to switch between ON and OFF. The tracking function must be in OFF position to be deactivated. Confirm with ✔.
4. The display returns to Tracking. Press ↻ repeatedly until the display shows quit. Confirm with ✔. The display returns to Setup.

Now you are back in the main menu and can switch to other satellites or make adjustments in the Setup menu.

!! When the Tracking function is deactivated, the antenna does not track the satellite, so it is possible that the TV picture sometimes can deteriorate or drop out. A realignment with the satellite is always possible: Press ↻ repeatedly until the display shows a flashing Sat. X (whereas X is the respective number of the selected satellite). Confirm with ✔.

5. Satellites

5.1. Adding new satellites

The search and storage of new satellites on the ship must be done in the harbour in calm waters! For every satellite at least one channel must be preprogrammed in the receiver to control the satellite position of the antenna unit by means of the TV picture quality. Make sure the preprogrammed TV station for the desired satellite is turned on at the receiver, as the system stops at each receivable satellite. The satellite can be identified by the quality of the TV picture.

Please proceed as follows:

1. To go to the Setup menu, press ↻ repeatedly until the display shows Setup (flashing), then press ✔. Enter password, see chapter 3.4. If the password is correct you are in the Setup menu with the display showing: Tracking.
2. Press ↻ repeatedly until New Sat appears on the display. Press ✔ to select. For two seconds Search? appears and changes to Sat. X.

!! New Sat only appears in the display, if free satellite storage positions are available. In case all storage positions are occupied, the less required ones have to be deleted first (see chapter 5.3).

Now you have the possibility to choose between **band-tracking** and **channel-tracking**.

The advantage of the channel-tracking mode is the ability to calculate and adjust the elevation angle in realtime. Among others a selection of the measurement frequency is available. By this method the antenna can get prevented of external interfering radiation. With the new devoloped additional sensor-tracking system it is also possible to track the satellite when you lose the signal from the satellite (due to a passing boat, buildings on shore, bridges, or superstructures on own boat). This feature also helps to regain the satellite even faster.

Whereas the band-tracking mode can achieve a better tracking result.

We recommend the channel-tracking mode. With the ◊ key you will automatically get into the channel-tracking mode. By pressing the ◊ key repeatedly you can choose the desired stored satellite. Confirm with ✔.
If you choose band-tracking, please confirm Sat. X by pressing ✔.

3.a) If you choose a satellite name (Channel- Tracking) the display shows checking for 1-2 seconds. Meanwhile the data from the GPS antenna will be checked to calculate the right scew and elevation angle for the desired satellite. If the GPS antenna didn´t received any data the display shows Wait GPS until the data were received.

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After that the adjusted value is getting compared with the calculated value and in case of a difference the display shows Turn LNB interchanging with LIN X (X is the skew angle has to be adjusted, see chapter 3.5 or the addendum " How to adjust the polarisation angle (Skew)).

To continue press the ◊ key or ✔ key . (To change the LNB Type (chapter 6.1) stop the search (at following point 6). ScnBand? is shown on the display 2 seconds. After that press the ◊ key to choose between Band1 and Band4 to select the band in which the satellite has to be searched.

3.b) If you confirm Sat. X (Band-Tracking) the display shows ScnBand? for 2 seconds.
After that press the ◊ key to choose between Band1 and Band4 to select the band in which the satellite has to be searched.

Please refer to the band numbers in the following table:

Band 1	10700 MHz – 11700 MHz Polarization vertical	(vertical low / VL)
Band 2	10700 MHz – 11700 MHz Polarization horizontal	(horizontal low / HL)
Band 3	11700 MHz – 12750 MHz Polarization vertical	(vertical high / VH)
Band 4	11700 MHz – 12750 MHz Polarization horizontal	(horizontal high / HH)

Example:

Astra 1	Band 3
Hotbird	Band 3
Sirius	Band 3
US	Band 2

4. Confirm with ✔ or cancel with ◊.
5. The display interchanges between New Sat. and Search?.
6. Confirm with ✔, or cancel with ◊.
7. In case you canceled the process, the display will briefly show cancel and then return to the Setup menu showing New Sat. (see point 2!). If you confirmed, the search mode is activated and the display shows scanning (flashing). The search mode can be interrupted at any time by pressing ◊, which brings you back to the main menu. The display shows Setup (flashing).

8. If a satellite is found, the scanning mode will be stopped and `checking` appears on the display for a few seconds. If the signal is strong enaough, the display shows `Sat ok?` (flashing). Otherwise the antenna continues scanning and `scanning` appears on the display. Check the quality of the TV picture! In case there is no picture or the wrong TV channel, proceed with the search-mode by pressing ↻ repeatedly until the correct TV channel is found. Press ✔ to confirm.
9. The display shows `Save as?` just for a brief moment.
10. A list of the different storage positions is shown. Use the ↻ key to choose between `Sat 1` and `Sat 4`, confirm with ✔.

Note! If you want to use the Auto-Sat function (only available on single and twin antennas, see chapter 5.4.1), please consider that only free storage positions are shown. Every receiver supporting the DiSEqC™ function allocates the satellite positions to one of the DiSEqC™ positions 1 – 4. Therefore, make sure that all satellites in the DiSEqC™ menu of the receiver and of the antenna unit are stored under the same number! This allows the use of the Auto Sat function (see chapter 5.4.2).

!! Example: Satellite Astra is stored at DiSEqC ™ position 2 in the receiver, meaning that this satellite has to be stored in the antenna unit at Sat 2! Receivers which do not support the DiSEqC ™ function will allow any order of numbers.

11. The display interchanges between a flashing `Sat X` and `save?`, whereas X is the previously chosen storage position. Confirm with ✔.
    If you want to cancel the function, press ↻, which interrupts the storage. The display will briefly show `cancel` and then return to `Sat ok?`. You may now continue the search, or you can store the satellite just received at another storage position. (see point 4!).
12. If you chose to confirm in point 11, the display shows `saving..` (flashing) for appr. 10-20 seconds. The data of the satellite is now automatically memorized and stored. The display briefly shows: `checking`.

!! While the data is being stored, the ship must not move, a permanent clear view to the satellite must be guaranteed, and the antenna unit must not be turned off!

13. When the data is memorized, the display shows `complete` for a brief moment and then the system automatically jumps to the TV mode of the just stored satellite (the display shows `Sat X`, whereas X is the storage position). The ship can now be moved and the reception tested. In case a failure occurs and the data is not memorized correctly, the display shows `ErrSave` and the search has to be done again.

!! For each new satellite, the search mode must be repeated! You can store up to four satellites.

14. If the tracking system has scanned the whole area without finding a satellite, the display shows `scanning` interchanging with `complete`. Confirm with ✔. You are back in the main menu with `Setup` flashing. Before restarting the search mode (see point 1), check whether there is a clear view to the satellite, the program selected on the receiver is ok (possibly change to another program) and whether the respective satellite can be received in this area! If no satellite is found, repeat the search in an other band (see point 3).

!! Before you restart the search-mode, make sure that no superstructures obstruct the view to the satellite!

5.2. Update of satellite data base

Example : The Astra satellite was stored with Band-Tracking in German waters. Now the vessel is sailing in Scandinavian waters. Accordingly the elevation angles, respectively frequency data have been changed and it takes longer to locate the satellite. To shorten the search time, new data for the angles have to be stored:

1. To go to the Setup menu, press ❮❯ repeatedly until the display shows `Setup` (flashing), then press ✔. Enter password, see chapter 3.4. If the password is correct you are in the Setup menu.
2. Press ❮❯ repeatedly until `UpdSat` appears. Now the up-to-date elevation angles, respectivaly frequency data of the satellite can be stored by pressing ✔. Please keep in mind, that the menu item `UpdSat` is not shown, if the tracking function is deactivated (see chapter 4.1).
3. The display interchanges between `Sat X` (storage position of current satellite) and `UpDate` .
4. To cancel press ❮❯ / to confirm (if the picture quality is optimal), press ✔.
5. If you chose to cancel, the display shows `cancel` for a brief moment. If you chose confirm, the display interchanges between `updating` and `checking`.
6. After the correct update , the display shows `complete` for a brief moment and the system automatically jumps to the TV mode. If the update was not successful the display shows `ErrSave` and the system returns to the menu item `UpdSat`. In this case, please repeat the update.

Next time the antenna is turned on, the angles and frequency data of the satellite are stored for the current area.

5.3. Delete stored data

To delete stored satellite positions, the following steps must be completed:

1. Go to the Setup menu: press ❮❯ repeatedly until the display shows `Setup` (flashing), then press ✔. Enter password, see chapter 3.4. If the password is correct you are in the Setup menu.
2. The display now shows `Tracking`. Press ❮❯ repeatedly until `Del Sat` appears. Press ✔.

!! `Del Sat` only appears if satellites are stored in the system.

3. The display shows `Sat X`, whereas X is the first satellite storage position to be deleted. To choose the satellite to be deleted, press ❮❯ and confirm with ✔.
4. The display interchanges between `Sat X` and `Delete`. To confirm, press ✔ / to cancel, press ❮❯.
5. If you chose confirm the display shows `complete` for a brief moment. If you chose cancel, the display shows `cancel`.
6. In both cases, the display will return to `Del Sat`.

!! If no further satellites are available for deletion, the display shows `Tracking`!

If there are more satellites in the system you wish to delete, press ✔ and repeat from point 3! If you want to leave the menu, press ❮❯ until `quit` appears and then press ✔. The display shows `Setup` (flashing). Now you are back in the main menu and can switch to other satellites or make adjustments in the Setup menu by pressing the ❮❯ key.

5.4. Selection of stored satellites

5.4.1. Automatic selection of satellites

!!Only for Single and Twin Antennas

For an automatic selection of satellites, the receiver must support the DiSEqC ™ function. Furthermore, it is important that all satellites in the DiSEqC™ menu of the receiver and of the antenna unit are stored **under the same number!** In case your receiver does not support DiSEqC™ please go to chapter 5.4.2.

!! **Example:** Satellite Astra is stored under DiSEqC™ position 2 in the receiver, meaning that this satellite has to be stored in the antenna unit under Sat. 2.

Press ↻ repeatedly until the display shows Auto Sat (flashing). Press ✔. From now on the antenna unit will take over the satellite positions from the receiver. The display interchanges between scanning and Sat. X, whereas X is the desired storing position. After the satellite is located, the display will continue to show Sat. X. The satellite tracking system is now in TV mode.

!! If Auto Sat does not appear in the display, the feature is not supported by the receiver (or not activated). The setting is DiSEqC 1..4 or similar. Refer to the user manual of the receiver.

If the selected satellite is not stored in the antenna unit, the display interchanges between Sat. X (the selected storage position) and noData. In this case, check the receiver parameters and store the satellite in the antenna unit, meaning that the search mode has to be started again (see chapter 4).

Now you can switch to the main menu (flashing display) by pressing the ↻ key.

5.4.2. Manual selection of satellites

For a manual selection of satellites, see the following procedure:

1. Press ↻ repeatedly until the display shows flashing Sat. X, whereas X is the satellite storage position.
2. Select between the storage positions 1 - 4 by pressing ↻. Confirm with ✔ .

!! Only satellites already stored are shown.

The display interchanges between scanning and Sat. X, whereas X is the desired storage position. After the satellite is found, the display will continue to show X. The satellite tracking system is now in TV mode.

6. Miscellaneous

6.1. Adjustments of LNB- type

To change the LNB- type please proceed as follows:

1. Go to the Setup menu, press ⟲ repeatedly until the display shows Setup (flashing), then press ✔. Enter password, see chapter 3.4. If the password is correct you are in the setup menu, Tracking is shown on the display.
2. Press ⟲ repeatedly until LNB Type appears. Press ✔ to confirm.
3. The display will show the standard setting lin 0 which is valid for Europe. By pressing the ⟲ key you can change the LNB settings. Press ✔ to select. The display will return to LNB Type.

Just for River/ Basic Line antennas:

!!Please consider that the LNB type is preset to lin 0. The LNB mounting plate allows a modification of the skew, which can be adjusted to the location.

!! Important: In addition to the changes of the control unit the skew (polarization angle) at the LNB and the matrix has to be changed accordingly (attend to the addendum „ How to adjust the polarisation angle (Skew)“).

The integrated GPS module is able to calculate the right skew and elevation angle of the desired satellite (only in Channel-Tracking mode! see chapter 5.1) and it is competent to inform about a difference (within the menu New Sat.) between the adjusted and calculated settings .

Reception of circular polarized satellites will require a circular LNB type.

To change this, go to the SETUP menu till the display shows LNB Type

Press ✔ to change then press ⟲ until the display shows Circular and press ✔ to select.

4. Press ⟲ repeatedly until quit appears. Press ✔ to confirm, Setup appears (flashing).

You are now back in the main menu and can switch to other satellites by pressing the ⟲ key or make adjustments in the Setup menu by pressing the ✔ key.

6.2. Special functions via the Standby mode

The following information can be obtained via the Standby mode: software version of antenna unit and control unit, serial number and operating hours counter.

Please proceed as follows:

1. Turn on the control unit. The display shows Init., meaning initialization is started. Wait for the initialization to be completed, and then press the ⏻ key to enter the Standby mode.
2. To obtain the special functions, press and hold the ✔ key while switching between the following functions with the ⟲ key:

- serial number.
- operating hours counter.
- software version of the antenna unit: VA X-XX
- software version of the control unit: VC X-XX

3. After releasing the ✔ key, the display returns to Standby.

6.3. Fastscan function (US only)

The tracking system works faster with the Fastscan function. However, if the antenna is locked to a satellite and the TV does not show a picture, the Fastscan function can be deactivated by following these steps:

1. Press ↻ repeatedly until the display shows Setup (flashing), then press ✔. Enter password, see chapter 3.4. If the password is correct you are in the Setup menu with Tracking on the display.
2. Press ↻ repeatedly until FastScan appears. Press ✔ to confirm.
3. Press ↻ to switch from On to Off, and confirm with ✔.
4. The display now returns to FastScan. Press ↻ until quit appears and confirm with ✔. The display shows Setup (flashing).

Now you are back in the main menu and can switch to other satellites or make adjustments in the Setup menu by pressing the ↻ key.

7. APPENDICES

7.1. Maintenance

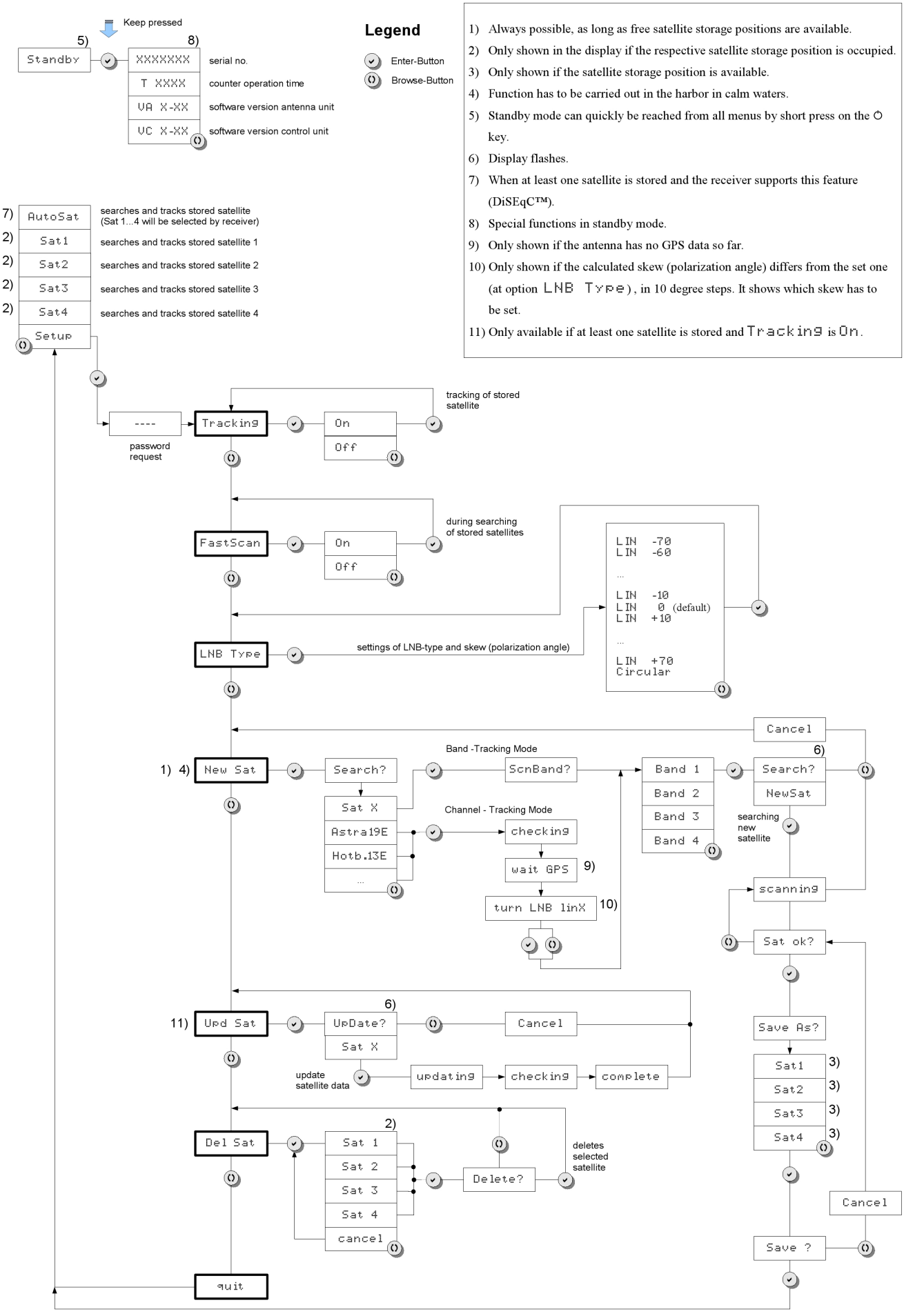
The satellite tracking system EPAK-TV is easy to maintain. The following instructions are sufficient to sustain an optimal capacity of the antenna unit:

- Clean the radome once a month using fresh water and a mild detergent to remove dirt and salt deposits.
- Do not detach the radome!
- Do not spray directly on the radome with high pressure water from a hose!
- Check cable connections to be tight and free of corrosion. Clean the cables regularly.

!! The radome has a protective layer of UV-stabilized and maritime climate-proof lacquer. Do not apply any additional paint, wax, preservative, solvent, chemicals, or adhesive labels. Do not use alcohol or dilution or similar products to clean the radome. Any kind of coating will void warranty claims! In case any solvent comes in contact with the radome by accident, rinse the area immediately with water and, if necessary, with a mild detergent!

!! A guarantee for UV and colour stability as well as fracture strength can only be given within the warranty of the supplier / dealer.

7.2. Overview of menu structure



7.3. Troubleshooting

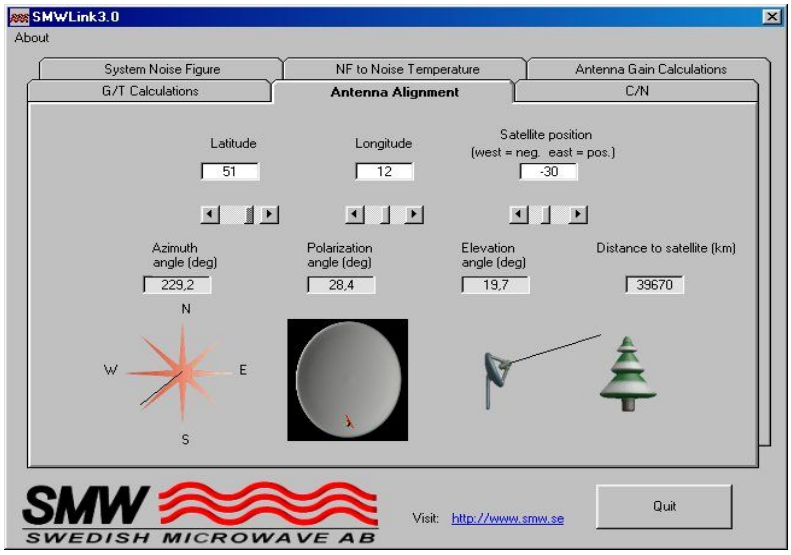
Display	Problem	Remedy
no dish	No connection to the antenna unit	- Check cable connection to antenna unit (power and antenna cable) - Check antenna unit's power supply
ErrorCom	Communication error with antenna unit	Turn unit off and after 3 seconds on again
Low Vsup	Power supply too low (<11.5V)	- Check power supply connection for antenna unit (loose cable, etc.) - Charge vessel's battery, if antenna is connected without power converter
no Data	The satellite position requested by the receiver in AutoSat mode is not stored in antenna unit	- Check the DiSEqC™ adjustment of the receiver - Add satellite and store position (see chapter 5.1).
Err HR	Read error of horizontal unit	Turn the unit off and on again. In case the error reoccurs, call for technical assistance. In case of errors regarding limit switches: Check all moving parts for nonblocking functionallity
Err HW	Write error of horizontal unit	
Err VR	Read error of vertical unit	
Err VW	Write error of vertical unit	
Err SR	Read error of signal processing unit	
Err VCO	Error during satelite inspection	
Err SW	write error of signal processing unit	
Err EEP	Error during storage	
Err IIC	Error in internal communication	
Err Trck	Error in tracking module	
Err ULS	Error in upper limit switch	
Err LLS	Error in lower limit switch	
Err ELS	Error in eastern limit switch	
Err WLS	Error in western limit switch	
Err Save	Error while saving satellite	Repeat search and storing procedure. Make sure the boat is not moving and no superstructures obstruct the sight to the satellite

Display	Problem	Remedy
<Short!>	There is a short in the connection between Control Box and antenna	Check cable connection to antenna and rotary joint inside the antenna
complete	The search for a stored satellite was successful, but no picture is shown	- Deactivate Fastscan mode - Delete satellite storage positions and memorize again
Sat. X interchanging with no Sig	No reception of the stored satellite	- Check if superstructures (e.g. steeple cab) obstruct the sight to the satellite - if so, move the boat about 3° - Reception can be briefly interrupted by passing boats
scanning interchanging with complete	No receptable satellite in the entire search range	- Select other program on the receiver and search again. - Check, if any superstructures are obstructing the sight to the satellite - Check, by using footprint cards (e.g. www.satcodx.com), whether the boat is inside the coverage area (footprint)
update reco	It is recommended to update the saved satellite data	- Do an update of the satellite data. See chapter 5.2.
	Cannot find a satellite	- Check, if superstructures obstruct the view to the satellite, and restart the search mode
	Cannot find a stored satellite	- Check, if superstructures obstruct the view to the satellite - Delete the stored satellite and restart the search mode
	Search for stored satellite takes longer, even though there are no obstructions in the view to the satellite	- Modify angles of the satellite at the new location with the function Upd Sat, see chapter 5.2.

7.4. Skew settings

The word „Skew“ means the polarization angle of the LNB. This angle depends on your geographical position and the orbital position of the satellite.
Example: For the reception of Hispasat (30°W) in Leipzig you have a skew of +28°. This means on the menu item `LNB type` **you have to choose** `Lin +30`.
(just for premium line antennas)
You have to change this setting only in Band-Tracking Mode, which is entered by selecting `SAT X` on the menu item `New Sat`.
In case you choose a named satellite, like e.g. `Hispa30W` you do not need to change the `LNB type`, because then the skew will be adjusted automatically. For this you can press ❮❯ until you can choose the choosed satellite and press then ✔. At the same time the antenna enters Channel-Tracking Mode.

For the calculation of the skew, we recommend the software SMWLink, which is available for free at www.smw.se.



7.5. Replaceable parts

- Electronic box; skew box (just for premium line antennas)
- LNB, matrix board
- Sensor and limit switch unit
- Control unit

7.6. Optional parts

Multi users kit, amplifier, splitter, etc.

All parts are available at your local authorized dealer/installer.

!! Unauthorized attempts made to open the radome will void any warranty claims!

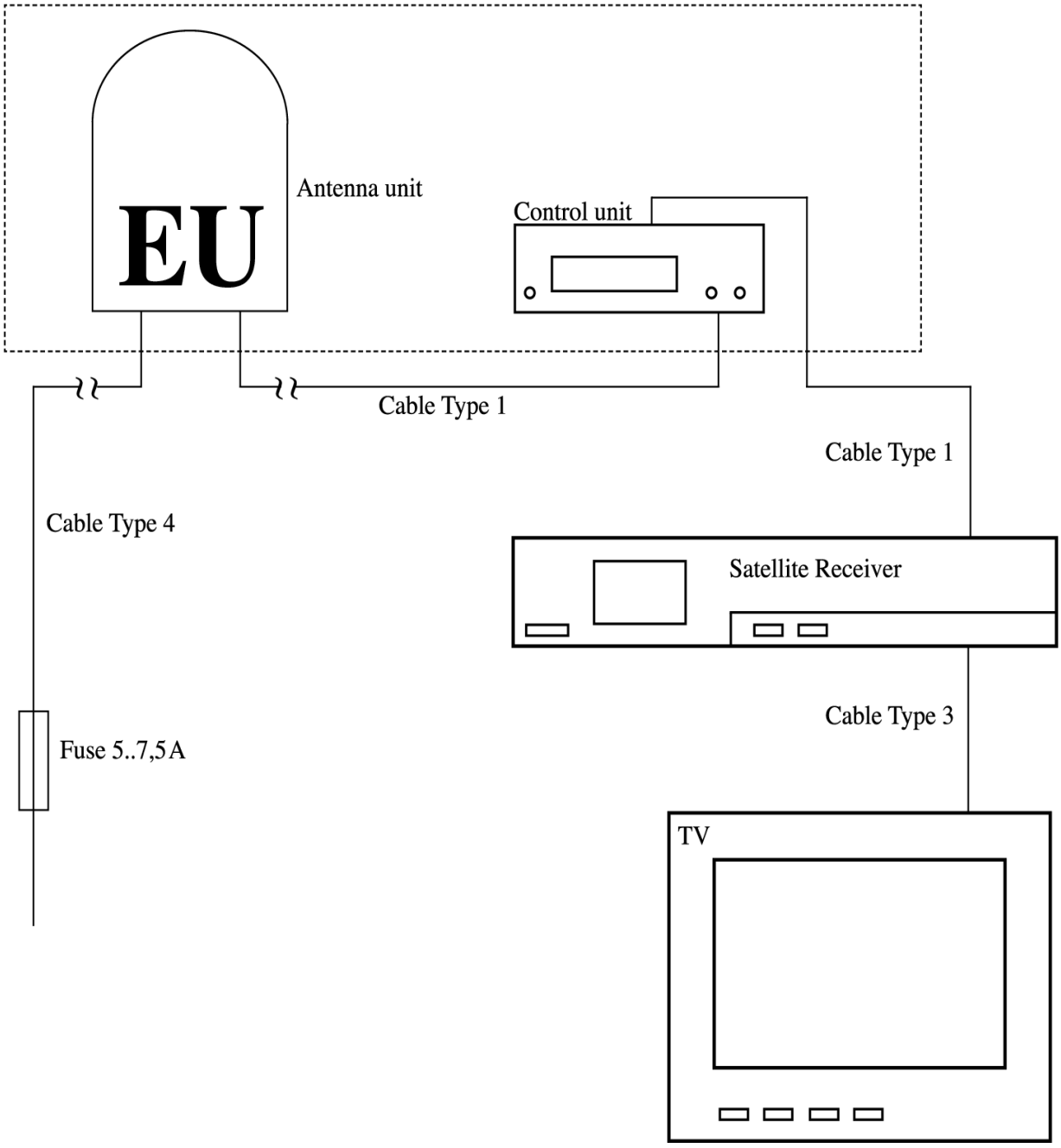
7.7. System overview

7.7.1. General cable data

Type 1 Double shielded satellite coax cable (75 Ohms) with F-connectors (one-wire).
Type 2 Double shielded satellite coax cable (75 Ohms) with F-connectors
(five-wire in one coating).
Type 3 AV cable or Antenna cable (depends on user's installation).
Type 4 Power cable (min. 2 x 1.5sqmm), max. length 15m.

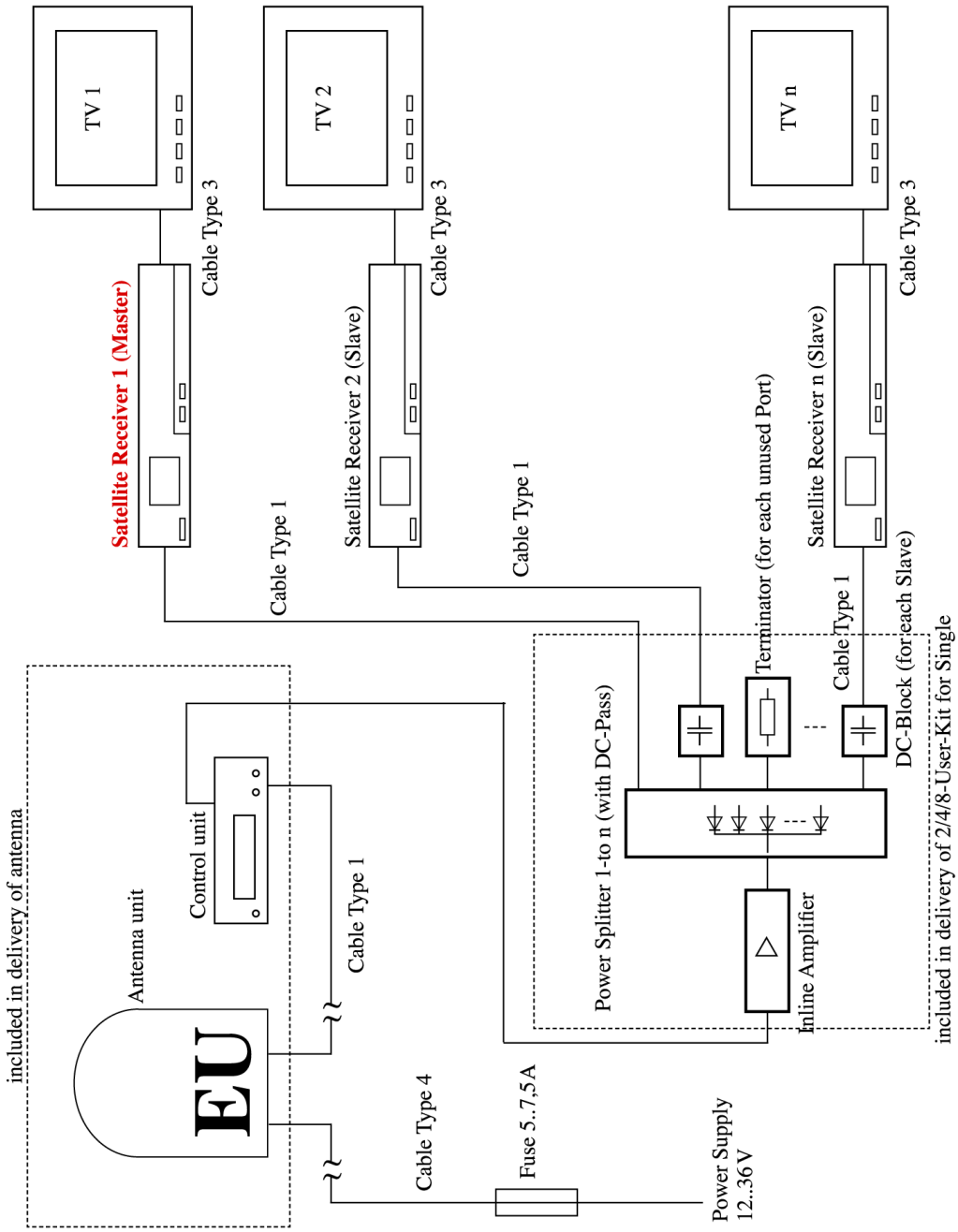
7.7.2. Single User on Single EU Antenna

One receiver has unlimited access to all channels of all 4 bands. It can switch antenna on/off as well as select another satellite.



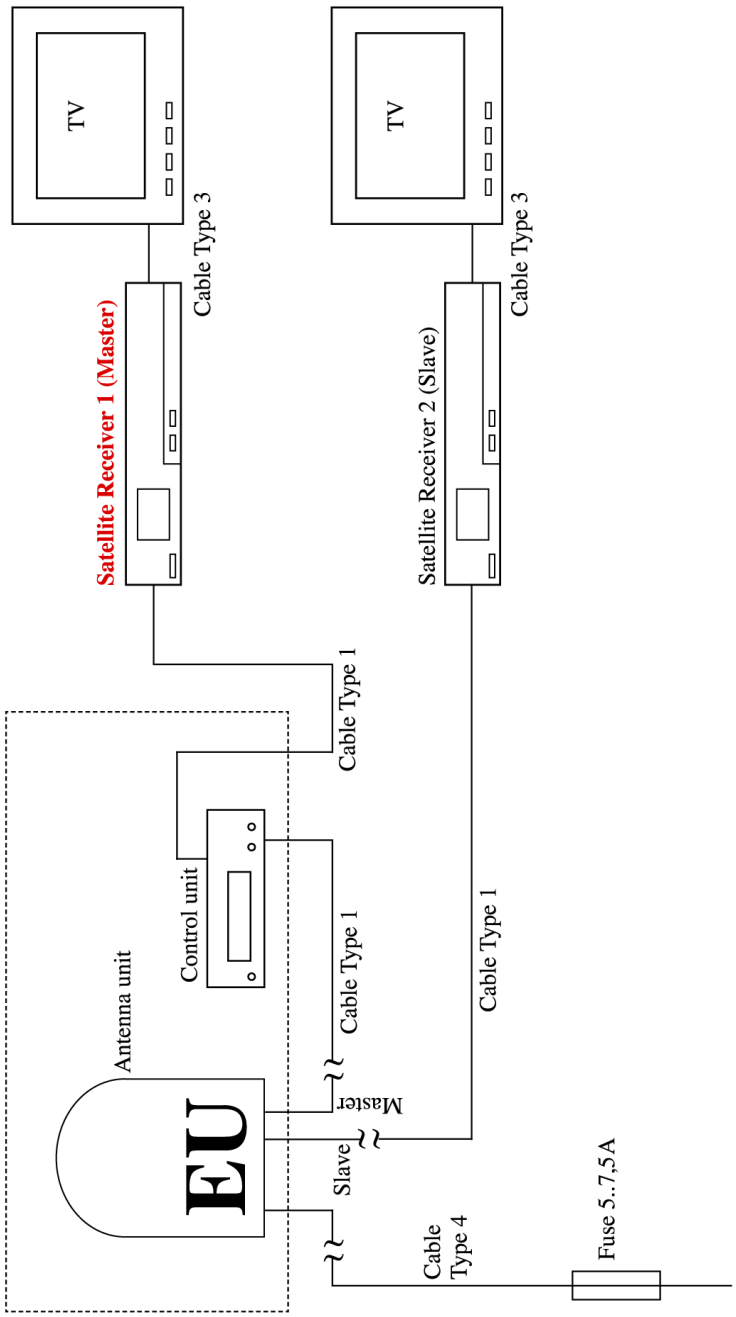
7.7.3. Multi Users on Single EU Antenna

The master receiver has complete access to all channels of all 4 bands. It can switch the antenna on/off a well as select another satellite. All slave receivers have access to all TV channels from the band at the satellite selected by the master receiver.



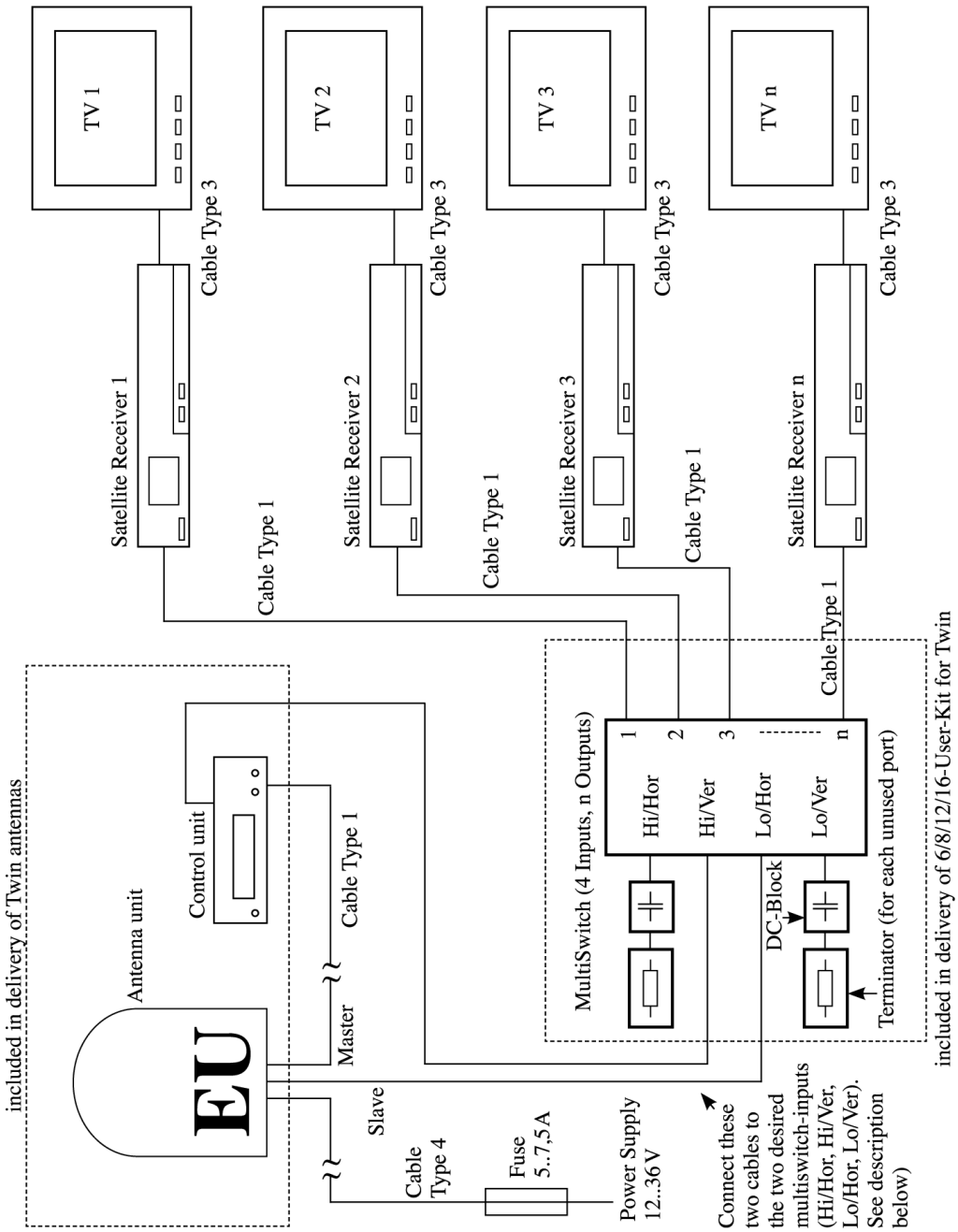
7.7.4. Two Users on Twin EU Antenna

Both receivers work independently and have complete access to all TV channels from all 4 bands. Both can switch the antenna on/off. Only the master receiver can select another satellite.



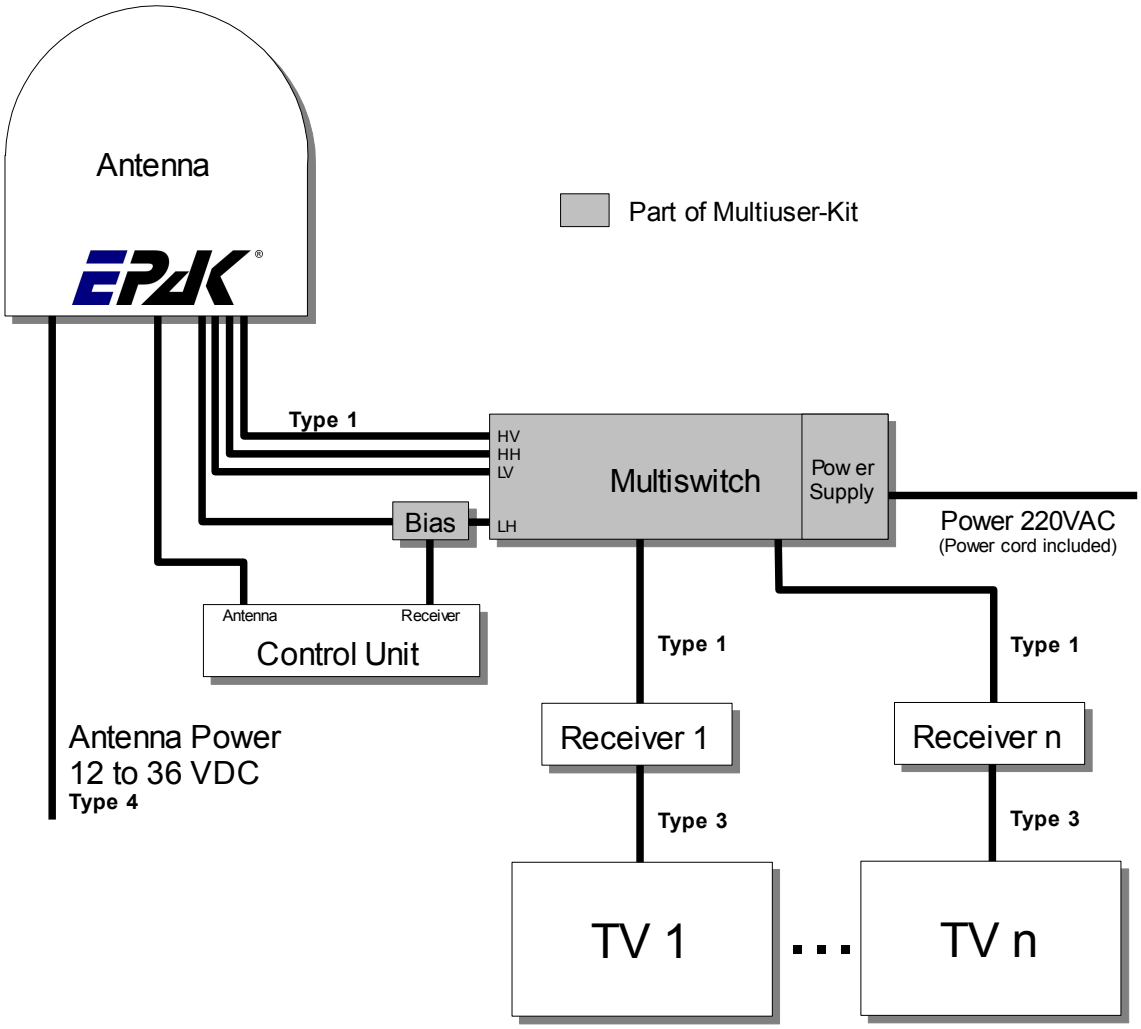
7.7.5. Multi Users on Twin EU Antenna

All receivers work independently and have complete access to all TV channels from two of the four bands. They can switch the antenna on/off. Only the Control Unit can select another satellite.



7.7.6. Multi Users on Quattro EU Antenna

All receivers work independently and have complete access to all TV channels of all 4 bands. They can switch the antenna on/off. Only the Control Unit can select another satellite.



Multi User configuration with Quattro EU Antenna
All receivers have independent access to all TV channels of all 4 bands. Can switch antenna on/ off. Only Control Unit can change sat-position.

7.8. Elevation angles

Area	Sirius (5°E)	Hotbird (13°E)	Astra (19°E)	Turksat (42°E)
Antalya	39°	43°	45°	47°
Athens	41°	44°	45°	45°
Balaton	31°	34°	35°	36°
Barcelona	42°	40°	39°	33°
Batumi	28°	39°	36°	40°
Berlin	29°	30°	30°	24°
Bordeaux	38°	33°	34°	29°
Bornholm	26°	36°	27°	25°
Burgas	36°	27°	40°	40°
Constanta	34°	37°	39°	39°
Copenhagen	26°	26°	26°	24°
Cork	28°	26°	24°	19°
Corsika	41°	41°	40°	36°
Crete	45°	48°	49°	49°
Crimera	30°	34°	36°	38°
Cyprus	40°	45°	47°	50°
Düsseldorf	31°	31°	30°	23°
Edinburgh	25°	24°	23°	19°
Gdansk	26°	27°	28°	26°
Gibraltar	46°	43°	40°	33°
Hamburg	29°	29°	28°	22°
Helsinki	19°	21°	21°	21°
Istanbul	36°	39°	41°	42°
Kiel	27°	27°	27°	25°
Leipzig	30°	31°	31°	25°
Lisbon	42°	39°	36°	28°
Majorca	44°	43°	41°	35°
Malta	47°	48°	48°	44°
Marseilles	40°	39°	38°	33°
Munich	34°	35°	34°	27°

Area	Sirius (5°E)	Hotbird (13°E)	Astra (19°E)	Turksat (42°E)
Naples	42°	43°	42°	39°
Palermo	45°	45	45°	41°
Plymouth	29°	28°	26°	21°
Rhodes	41°	45°	47°	48°
Riga	24°	26°	27°	26°
Rome	41°	41°	41°	38°
Rotterdam	30°	30°	30°	25°
Sardinia	43°	43°	42°	38°
Split	35°	38°	39°	40°
Stockholm	21°	22°	22°	21°
Stuttgart	34°	34°	33°	26°
Thessaloniki	39°	41°	42°	41°
Trondheim	18°	18°	18°	16°
Venice	37°	37°	37°	34°
Wilhelmshaven	28°	28°	27°	25°

7.9. Technical specifications

Antenna unit	TV 43 / TV 44	TV 58 / TV 59
Reflector Type	Prime Focus	Prime Focus
Reflector Diameter	45 cm (17.7")	60 cm (23.6")
Reflector Gain	33 dB	34.8 dB
Minimum E.I.R.P.* (for reception of geostationary satellites)	49 dBW	48 dBW
LNB (EU)	H/V linear, universal	H/V linear, universal
LNB (US)	LH/RH circular	LH/RH circular
Radome diameter	550 mm	710 mm
Radome height	550 mm	690 mm
Weight (incl. radome)	12 kg	16 kg
Azimuth range	unlimited	unlimited
Elevation range	5-85°	5-90°
Step width	0.1°	0.1°
Drive system	two-axis servo system	two-axis servo system
Tracking sensor	Electronic Beam Forming (EBF)	Electronic Beam Forming (EBF)
Tracking speed (at every movement of ship)	>12°/s / >40°/s	>12°/s / >40°/s
Power supply	12 bis 36VDC, 10 to 20W	12 bis 36VDC, 10 to 20W
Power on satellite lock time	10 to 20 s	10 to 20 s

System	TV 43 / TV 44	TV 58 / TV 59
Operation temperature	–20 to +70°C	–20 to +70°C
Storing temperature	–30 to +85°C	–30 to +85°C

Control unit	TV 43 / TV 44 / TV 58 / TV 59
Power supply	12 to 20VDC, 100mA (via coax cable)
Satellite acquisition	fully automatically by SatFingerprint Technology
Satellite storage position	4 (20 selected satellites deposited)
Selection of deposited satellites	control unit / receiver (via DiSEqC™ 1.0 or MiniDiSEqC™/ Tone-Burst)

Antenna unit	TV61	TV90
Type	Cassegrain reflector	Prime Focus
Diameter	60 cm (18")	90 cm (34")
Gain	33 dB	34.8 dB
Minimum E.I.R.P.* (for reception of geostationary satellites)	47 dBW	44 dBW
LNB (US)	LH/RH circular	
LNB (EU)	H/V linear, Universal	
Radome diameter	735 mm	1114 mm
Radome height	810 mm	1140 mm
Weight (incl. radome)	35 kg	56 kg
Azimuth range	unlimited	
Elevation range	0..90°	-10..+90°
Step width	0.1°	
Drive system	three-axis servo system	
Tracking Sensor	Electronic Beam Forming (EBF)	
Tracking range	unlimited (within the horizontal and vertical range)	
Positioning speed	<35 °/s	
Tracking speed (at every movement of ship)	<40 °/s	
Power supply	12 to 36 VDC, 10 to 20 W	
Lock on time	typ. 30 s	
Control unit		
Power supply	12 to 20 VDC, 100 mA (via coax cable)	
Satellite acquisition	completely automated by SatFingerprint Technology	
Satellite positions	up to 4 freely programmable positions	
Selection of programmed satellites	by control unit respectively satellite receiver (DiSEqC™ 1.0)	
System		
Operation temperature	–20 to +70 °C	
Storing temperature	–30 to +85 °C	

DiSEqC™ is a trademark of Eutelsat.

Please note that our antennas are subject to a permanent upgrade. Therefore, divergences to the present document may occur.